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09/745,044	12/20/2000	Hiroyasu Murata	FUJH 18.100	7948

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EXAMINER

WILLIAMS, LAWRENCE B

ART UNIT	PAPER NUMBER
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2634

DATE MAILED: 06/18/2004

*Handwritten number 4*

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/745,044

Applicant(s)

MURATA, HIROYASU

Examiner

Lawrence B Williams

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 20 December 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 December 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 1.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Drawings*

1. This application has been filed with informal drawings, which are acceptable for examination purposes only. Formal drawings will be required when the application is allowed.
2. The drawings are objected to under 37 CFR 1.83(a) because they fail to show the direction or the shift parameter  $V_w$  (D) as described in lines 17-19 on page 16 in the specification. Examiner suggests applicant used an arrow to show the direction of the relationship and apply a label. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### *Specification*

3. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

4. The disclosure is objected to because of the following informalities:

a.) Examiner suggests applicant replace the word “convulsion” with “convolution” in lines 21 and 22 of page 20.

b.) Applicant makes reference to parameter  $W_w$  in line 27 of page 16 and also in line 3 of page 17. Examiner is unable to find support for this parameter in either of the accompanying figures.

c.) Applicant makes reference to parameter E in line 2 of page 17. Examiner is unable to find support for this parameter in either of the accompanying figures.

Appropriate correction is required.

5. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

### *Claim Objections*

6. Claim 2 is objected to because of the following informalities:

a.) Examiner suggests applicant explain acronym LMS. Ex: (Least Mean Square).

Appropriate correction is required.

7. Claim 10 is objected to because of the following informalities: Claim 10 recites the limitation "said FET output" in 14. There is insufficient antecedent basis for this limitation in the claim.

Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

9. Claim 13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 13 incorporates the use multiple variables of a claimed “coefficient algorithm” formula. Applicant must define each variable in the claim “coefficient algorithm”.

10. Claim 15 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: Applicant does not clearly disclose the step relating the “signal” and “synchronous signal”. Applicant also fails to disclose the step of the removal of the cyclic prefix..

11. Claims 14 and 15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Both claims cite the acronym “TEQ”. Examiner suggests applicant clearly define this acronym.

***Claim Rejections - 35 USC § 101***

12. 35 U.S.C. 101 reads as follows:

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Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

13. Claim 15 is rejected under 35 U.S.C. 101 because applicant attempts to claim a training and synchronization pattern (ones and zero). This claim is directed to non-statutory subject matter.

***Claim Rejections - 35 USC § 102***

14. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

15. Claims 1, 5, 7, 9, 10-12, 14, 15 are rejected under 35 U.S.C. 102(e) as being anticipated by Hasegawa et al. (US Patent 6,735,244 B1).

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C.

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102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

(1) With regard to claim 1, Hasegawa et al. discloses in Fig. 6 and 7, a coefficient update method for a time domain equalizer (90) of a DMT system (col. 1, lines 36-42), which uses multi-carrier modulation, comprising; a step of calculating the response characteristics of a channel and those of said time domain equalizer from the output (630) of said time domain equalizer during a training period, and updating the coefficient of said time domain equalizer; and a step of calculating the characteristic parameters of a channel and those of said time domain equalizer from the output of said time domain equalizer using a synchronization signal during a data period and updating the coefficient of said time domain equalizer (col. 16, lines 51-54; col. 17, lines 45-51).

(2) With regard to claim 5, Hasegawa et al. also discloses in Fig. 6, a receive method of a DMT system (col. 1, lines 36-42), which uses multi-carrier modulation, comprising; a time domain equalizer (90) step of equalizing receive signals in the time domain; a step of performing FFT (110) processing on the output of said time domain equalizer; a step of performing frequency domain equalizer processing (1410) on said FFT-processed output; a step of decoding (1420) the output of said frequency domain equalizer; and a step of calculating the response characteristic of a channel and those of said time domain equalizer from the output of said time domain equalizer (col. 17, lines 28-33) according to the synchronization pattern of a training

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period and of a data period, and updating the coefficient of said time domain equalizer (col. 16, lines 51-54; col. 17, lines 45-51).

(3) With regard to claim 7, claim 7 inherits the limitations of claim 5, above.

(4) With regard to claim 9, Hasegawa et al. also discloses in Figs. 1 and 6, a DMT system which uses multi-carrier modulation, comprising; a channel (2); a transmitter (1c) which performs multi-carrier modulation on a training pattern during a training period and on a synchronization pattern during a data period, and outputs the patterns to the channel; and a receiver (3a) which performs multi-carrier demodulation on receive signals from said channel, wherein said receiver equalizes said receive signals in the time domain using a time domain equalizer (90), performs FFT processing (110) on the output of said time domain equalizer, then equalizes said FFT-processed output in the frequency domain using a frequency domain equalizer (1410), and also calculates the response characteristic of the channel and those of said time domain equalizer from the output of said time domain equalizer (630; col. 17, lines 28-33) according to the training pattern and the synchronization pattern, and updates the coefficient of said time domain equalizer col. 17, lines 14-51).

(5) With regard to claim 10, claim 10 inherits all limitations of claim 9, above.

(6) With regard to claims 11 and 12, claims 11 and 12 inherit the limitations of claims 9 and 10 above.

(7) With regard to claim 14, Hasegawa et al. also discloses a coefficient update method for TEQ wherein the coefficient of the TEQ is updated by a signal after a cyclic prefix of a synchronous signal is removed.



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(8) With regard to claim 15, Hasegawa et al. also discloses a coefficient update method for TEQ wherein a training pattern and a synchronization pattern are the same pattern (col. 17, lines 46-51).

*Claim Rejections - 35 USC § 103*

16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

17. Claims 2, 6 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hasegawa et al. (US Patent 6,735,244 B1) as applied to claims 1, 5 and 7 above, and further in view of Hasegawa et al. (US Patent 6,289,045 B1).

(1) With regard to claim 2, as noted above, Hasegawa et al. discloses all limitations of claim 1. Hasegawa et al. does not however disclose the update method for the time domain equalizer wherein said coefficient update step has a step of calculating the coefficient of said time domain equalizer to minimize the errors of said response characteristic using the LMS.

However, Hasegawa et al. discloses a coefficient update method for a time domain equalizer wherein said coefficient update step has a step of calculating the coefficient of said time domain equalizer to minimize the errors of said response characteristic using the LMS (col. 6, lines 15-23).

One skilled in the art would have clearly recognized that a coefficient update method for the time domain equalizer wherein said coefficient update step has a step of calculating the coefficient of said time domain equalizer to minimize the errors of said response characteristic using the LMS is a well-known technique introduced in many references. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to apply the method as taught by Hasegawa et al. (US Patent 6,289,045 B1) to modify the invention of Hasegawa et al. as a training method which could easily correct DC components contained in the channel target characteristic and the characteristic in the time domain equalizer (col. 1, lines 35-46).

(2) With regard to claim 6, claim 6 inherits all limitations of claims 1 and 5 above.

(3) With regard to claim 8, claim 8 inherits all limitations of claims 6 and 7 above.

18. Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hasegawa et al. (US Patent 6,735,244 B1) in view of Hasegawa et al. (US Patent 6,289,045 B1).

(1) With regard to claim 3, Hasegawa et al. discloses in Figs. 6 and 7, a coefficient update method for the time domain equalizer (90) of a DMT system, which uses multi-carrier modulation, comprising; a step of calculating the response characteristics of a channel and those of said time domain equalizer from the output of an FFT (110) at a subsequent stage of said time domain equalizer. He does not however disclose a step of calculating a coefficient of said time domain equalizer to minimize the errors of said response characteristics using the LMS.

However, Hasegawa et al. (US Patent 6,289,045 B1) discloses a step of calculating a coefficient of said time domain equalizer to minimize the errors of said response characteristics using the LMS (col. 6, lines 15-23).

One skilled in the art would have clearly recognized that a coefficient update method for the time domain equalizer wherein said coefficient update step has a step of calculating the coefficient of said time domain equalizer to minimize the errors of said response characteristic using the LMS is a well-known technique introduced in many references. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to apply the method as taught by Hasegawa et al. (US Patent 6,289,045 B1) to modify the invention of Hasegawa et al. as a training method which could easily correct DC components contained in the channel target characteristic and the characteristic in the time domain equalizer (col. 1, lines 35-46).

(2) With regard to claim 4, Hasegawa et al. (6,735, 244 B1) also discloses the coefficient update method for the time domain equalizer, wherein said step of calculating said coefficient comprises; a step of calculating a convolution coefficient to minimize the errors of said response characteristics using the LMS; and a step of updating the coefficient of said time domain equalizer using said convolution coefficient (col. 7, lines 10-21).

*Allowable Subject Matter*

19. Claim 13 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

*Conclusion*

20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lawrence B Williams whose telephone number is 703-305-6969. The examiner can normally be reached on Monday-Friday (8:00-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 703-305-4714. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Lawrence B. Williams

lbw  
June 1, 2004

  
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